

FERNS OF THE SHAWNEE NATIONAL FOREST (ILLINOIS)

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During the last thirty years, the author has been studying the vegetation of the Shawnee National Forest in southern Illinois. Among the groups of plants well represented in the Shawnee are the ferns and the fern allies. This paper briefly describes the major regions for ferns in the Shawnee National Forest and follows with a complete list of the taxa of ferns and fern allies known.

Of the 101 taxa of ferns and fern allies recorded from Illinois (Mohlenbrock, 1967; Mohlenbrock, 1970; Mohlenbrock & Ladd, 1981), 65 have been found within the boundaries of the Shawnee National Forest. This is 64% of the ferns known from all of Illinois.

A variety of habitats accounts in part for the great diversity of plants known from the Shawnee National Forest. Major habitat types include beech-maple forests, oak-hickory forests, sandstone escarpments, limestone cliffs, and seep spring woods.

The Shawnee National Forest lies in several natural divisions in Illinois (Schwegman, 1975). It includes part of the Wabash Border Division, the Ozark Division, the Lower Mississippi River Bottomlands Division, the Shawnee Hills Division, and the Coastal Plain Division.

The Wabash River Border Division includes the bottomlands of the Wabash River. Only a small portion of this division occurs within the forest. These bottomland forests are dominated by pin oak, overcup oak, swamp white oak, basket oak, bur oak, cherrybark oak, and Shumard oak. Other associated woody species are sweet gum, common hackberry, American elm, kingnut hickory, silver maple, and pecan. Ferns which occupy this habitat are sensitive fern (*Onoclea sensibilis*), fragile fern (*Cystopteris fragilis* var. *protrusa*), and rattlesnake fern (*Botrychium virginianum*). On low ridges may be found the Christmas fern (*Polystichum acrostichoides*) and maidenhair fern (*Adiantum pedatum*).

The Lower Mississippi River Bottomlands Division includes the Mississippi River and its floodplain at the extreme western edge of the Shawnee National Forest. Typical floodplain forests are dominated by pin oak, overcup oak, Shumard oak, cherrybark oak, kingnut hickory, sugarberry, and sweet gum. Ferns include sensitive

fern (*Onoclea sensibilis*), fragile fern (*Cystopteris fragilis* var. *protrusa*), silvery spleenwort (*Athyrium thelypteroides*), rattlesnake fern (*Botrychium virginianum*), and grape fern (*Botrychium dissectum* var. *obliquum*). In the bottomland swamps which are found in the Lower Mississippi River Bottomlands Division, mosquito fern (*Azolla mexicana*) grows at the surface of the water.

The Ozark Division cuts into the western extremity of the Shawnee National Forest and is marked by a range of limestone cliffs overlain by chert. The division contains many Ozarkian, southern, and southwestern species of vascular plants, many of which are rare or absent elsewhere in Illinois. The forests contain a rich assemblage of trees, including cucumber magnolia, sour gum, butternut, black walnut, bitternut hickory, red oak, sugar maple, basswood, white oak, black oak, Ohio buckeye, beech, and tulip tree. Stands of the uncommon shortleaf pine occur here, as well. Numbered among the ferns confined to the Ozark Division of the Shawnee National Forest are several spleenworts (*Asplenium* × *kentuckiense*, *A.* × *trudellii*, *A.* × *herb-wagneri*, *A. resiliens*) and interrupted fern (*Osmunda claytoniana*). Commonly encountered ferns are walking fern (*Asplenium rhizophyllum*), ebony spleenwort (*Asplenium platyneuron*), baby lip fern (*Cheilanthes feei*), purple cliffbrake (*Pellaea atropurpurea*), glade fern (*Athyrium pycnocarpon*), and lady fern (*Athyrium filix-femina*).

The greatest diversity of ferns in the Shawnee National Forest is found in the Shawnee Hills Division, an unglaciated escarpment of sandstone cliffs of the Pennsylvanian running in an east-west direction across the forest. The cliffs, together with their intervening ravines, provide habitats for a rich assemblage of ferns. Shaded sandstone cliff-faces are suitable for the spinulose woodfern (*Dryopteris carthusiana*), intermediate fern (*Dryopteris intermedia*), marginal shield fern (*Dryopteris marginalis*), walking fern (*Asplenium rhizophyllum*), pinnatifid spleenwort (*Asplenium pinnatifidum*), maidenhair spleenwort (*Asplenium trichomanes*), and common polypody (*Polypodium vulgare* var. *virginianum*). Of less common occurrence on moist, shaded sandstone ledges are hayscented fern (*Dennstaedtia punctilobula*), netted chain fern (*Woodwardia areolata*), royal fern (*Osmunda regalis*), cinnamon fern (*Osmunda cinnamomea*), and three clubmosses (*Lycopodium lucidulum*, *L. porophilum*, and *L. digitatum*).

The exposed sandstone blufftops and the dry, wooded slopes are home to the common woodsia (*Woodsia obtusa*), hairy lip fern (*Cheilanthes lanosa*), and ebony spleenwort (*Asplenium platyneuron*). In moist depressions on exposed sandstone bluffs is quillwort (*Isoetes melanopoda*) (Taylor, Mohlenbrock, & Murphy, 1975). These upland woods and blufftops are dominated by a number of species of oaks and hickories.

By contrast, the deep, intervening mesic canyons are inhabited by beech-maple forests. In addition to beech and sugar maple, other common trees are tulip tree, white ash, black walnut, Ohio buckeye, basswood, and honey locust. The fern flora of the ravines is luxuriant. Among the more widespread ferns are maidenhair fern (*Adiantum pedatum*), glade fern (*Athyrium pycnocarpon*), lady fern (*Athyrium filix-femina*), silvery spleenwort (*Athyrium thelypteroides*), and Christmas fern (*Polystichum acrostichoides*).

Only a small tongue of the Coastal Plain Division extends into the Shawnee National Forest. Although this division is primarily composed of cypress-tupelo swamps, some woodland acidic seep springs occur in the eastern side of the Shawnee National Forest. These seep springs contain an interesting flora dominated by ferns, orchids, and sedges, with sphagnum moss covering much of the ground. Ferns in abundance are cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis*), netted chain fern (*Woodwardia areolata*), and marsh fern (*Thelypteris thelypteroides*).

Following is a list of ferns and fern allies known from the Shawnee National Forest. Voucher specimens for each taxon in the list are deposited in the herbarium of Southern Illinois University (SIU) or in the author's personal herbarium, with the exception of *Thelypteris phegopteris* which is at the University of Illinois (UI).

FERNS AND FERN ALLIES OF THE SHAWNEE NATIONAL FOREST (ILLINOIS)

EQUISETACEAE—HORSETAIL FAMILY

Equisetum arvense L. Horsetail. Wet ground; common.

Equisetum hyemale L. var. *affine* (Engelm.) A.A.Eaton. Scouring
Rush. Wet ground; common.

Equisetum variegatum Schleich. Horsetail. Wet ground; scattered.

Equisetum × *ferrissii* Clute. Intermediate Scouring Rush. Wet ground; scattered.

LYCOPODIACEAE—CLUBMOSS FAMILY

Lycopodium porophilum Lloyd & Underw. Clubmoss. Shaded sandstone ledges; three localities in the Shawnee.

Lycopodium lucidulum Michx. Shining Clubmoss. Shaded sandstone ledges; scattered but not common.

Lycopodium lucidulum Michx. var. *tryonii* Mohlenbrock. Clubmoss. Shaded sandstone ledge; Little Grand Canyon, the only known station in Illinois.

Lycopodium digitatum A. Braun. Ground Pine. Shaded sandstone ledge at Lusk Creek, apparently native; under pines in several plantations, apparently adventive.

SELAGINELLACEAE—LITTLE CLUBMOSS FAMILY

Selaginella apoda (L.) Spring. Little Clubmoss. Wet soil; scattered.

Selaginella rupestris (L.) Spring. Rock Clubmoss. On sandstone, Jackson Hollow; on chert, Pine Hills.

ISOETACEAE—QUILLWORT FAMILY

Isoetes melanopoda Gay & Dur. Quillwort. Depressions on sandstone; scattered.

OPHIOGLOSSACEAE—ADDER'S-TONGUE FERN FAMILY

Ophioglossum vulgatum L. var. *pycnostichum* Fern. Adder's-tongue. Exposed sandstone under *Juniperus virginiana*; scattered but uncommon.

Ophioglossum vulgatum L. var. *pseudopodium* (Blake) Fern. Adder's-tongue. Moist woods; scattered.

Ophioglossum engelmannii Prantl. Adder's-tongue. Exposed limestone; Pine Hills.

Botrychium dissectum Spreng. var. *dissectum*. Cut-leaved Grape Fern. Woodlands; scattered.

Botrychium dissectum Spreng. var. *obliquum* (Muhl.) Clute. Blunt-leaved Grape Fern. Woodlands; scattered, but more common than var. *dissectum*.

Botrychium biternatum (Sav.) Underw. Grape Fern. Moist woods; Little Grand Canyon and Draper's Bluff.

Botrychium virginianum (L.) Sw. Rattlesnake Fern. Woodlands; common.

OSMUNDACEAE—ROYAL FERN FAMILY

Osmunda regalis L. var. *spectabilis* (Willd.) Gray. Royal Fern. Sandstone ledges and seep spring woods; scattered but not common.

Osmunda cinnamomea L. Cinnamon Fern. Sandstone ledges and seep spring woods; scattered but not common.

Osmunda claytoniana L. Interrupted Fern. Woodland; along Grapevine Trail.

HYMENOPHYLLACEAE—FILMY FERN FAMILY

Trichomanes boschianum Sturm. Filmy Fern. Under overhanging sandstone bluffs; scattered and rare.

POLYPODIACEAE—FERN FAMILY

Dennstaedtia punctilobula (Michx.) Moore. Hay-scented Fern. Shaded sandstone ledge; Lusk Creek Canyon.

Adiantum pedatum (Tourn.) L. Maidenhair Fern. Moist woodlands; common throughout the forest.

Pteridium aquilinum (L.) Kuhn var. *latiusculum* (Desv.) Underw. Bracken Fern. Open woods, roadsides; scattered.

Pellaea atropurpurea (L.) Link. Purple Cliffbrake. Crevices of limestone; common where limestone outcrops.

Pellaea glabella Mett. Smooth Cliffbrake. Crevices of limestone; scattered and rare.

Cheilanthes feei Moore. Baby Lip Fern. Crevices of limestone; scattered.

Cheilanthes lanosa (Michx.) D.C.Eaton. Lip Fern. Dry woods, sandstone crevices; common.

Polypodium vulgare L. var. *virginianum* (L.) Eaton. Common Polypody. Rocky woods, mostly on sandstone; scattered.

Polypodium polypodioides (L.) Watt var. *michauxianum* Weatherby. Gray Polypody. Rocky woods; scattered.

- Polystichum acrostichoides* (Michx.) Schott. Christmas Fern. Woods and shaded bluffs; common.
- Onoclea sensibilis* L. Sensitive Fern. Moist woods; common throughout the forest.
- Thelypteris hexagonoptera* (Michx.) Weatherby. Broad Beech Fern. Rich woods; common.
- Thelypteris phegopteris* (L.) Slosson. Long Beech Fern. Rich woods; Fountain Bluff. This species may no longer be extant in the Shawnee National Forest.
- Thelypteris noveboracensis* (L.) Nieuwl. New York Fern. Rich wooded slope; Long Spring.
- Thelypteris thelypteroides* (Michx.) Holub. Marsh Fern. Marshy woods; scattered and rare.
- Dryopteris carthusiana* (Villars) H.P.Fuchs. Spinulose Fern. Shaded sandstone cliffs; scattered but not common.
- Dryopteris intermedia* (Muhl.) Gray. Intermediate Fern. Shaded sandstone cliffs; scattered but not common.
- Dryopteris goldiana* (Hook.) Gray. Goldie's Fern. Rich, rocky woods; scattered and rare.
- Dryopteris* × *neo-wherryi* W.H.Wagner. Wherry's Shield Fern. Rocky woods; Lusk Creek Canyon.
- Dryopteris marginalis* (L.) Gray. Marginal Shield Fern. Rocky woods and sandstone ledges; common.
- Woodwardia areolata* (L.) Moore. Netted Chain Fern. Marshy woods and sandstone cliffs; Jackson Hollow and Mill Spring.
- Athyrium pycnocarpon* (Spreng.) Tidestrom. Glade Fern. Rich woods; common.
- Athyrium thelypteroides* (Michx.) Desv. Silvery Spleenwort. Rich woods; scattered but not common.
- Athyrium filix-femina* (L.) Roth var. *rubellum* Gilib. Lady Fern. Rocky woods; common throughout the forest.
- Athyrium filix-femina* (L.) Roth var. *asplenioides* (Michx.) Farw. Southern Lady Fern. Deep canyon woods; scattered and rare.
- Asplenium rhizophyllum* L. Walking Fern. Rocky woods; on limestone; on sandstone; scattered.
- Asplenium pinnatifidum* Nutt. Pinnatifid Spleenwort. Crevices of sandstone cliffs; scattered.
- Asplenium* × *gravesii* Maxon. Graves' Spleenwort. Crevices of limestone cliff; Pine Hills. Only Illinois locality.

- Asplenium* × *kentuckiense* McCoy. Kentucky Spleenwort. Crevices of limestone cliff; Pine Hills. Only Illinois locality.
- Asplenium* × *herb-wagneri* Mohlenbr. & Taylor. Wagner's Spleenwort. Crevices of limestone cliff; Pine Hills. Only Illinois locality.
- Asplenium* *bradleyi* D.C.Eaton. Bradley's Spleenwort. Crevices of limestone and sandstone cliffs; Pine Hills and Panther's Den.
- Asplenium* × *ebenooides* R.R.Scott. Scott's Spleenwort. Crevices of limestone cliffs; rocky woods; scattered and rare.
- Asplenium* *trichomanes* L. Maidenhair Spleenwort. Crevices of sandstone or limestone cliffs; scattered.
- Asplenium* *resiliens* Kunze. Black Spleenwort. Crevices of limestone cliffs; scattered and rare.
- Asplenium* × *trudellii* Wherry. Trudell's Spleenwort. Crevices of limestone cliff; Pine Hills.
- Asplenium* *platyneuron* (L.) Oakes. Ebony Spleenwort. Moist or dry woods; common.
- Woodsia* *obtusa* (Spreng.) Torr. Common Woodsia. Dry woods, often on bluffs; common.
- Cystopteris* *bulbifera* (L.) Bernh. Bladder Fern. Rocky, limestone woods; scattered but not common.
- Cystopteris* *fragilis* (L.) Bernh. var. *fragilis*. Fragile Fern. Rich woods; Pine Hills.
- Cystopteris* *fragilis* (L.) Bernh. var. *protrusa* Weatherby. Common Fragile Fern. Woods; common.
- Cystopteris* *fragilis* (L.) Bernh. var. *mackayi* Laws. Mackay's Fragile Fern. Rich woods; Little Grand Canyon.
- Cystopteris* × *tennesseensis* Shaver. Tennessee Fragile Fern. Woods; Pine Hills and Fountain Bluff.

SALVINIACEAE—MOSQUITO FERN FAMILY

- Azolla mexicana* Presl. Mosquito Fern. Standing water, usually in swamps; scattered but not common.

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